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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/702,082	11/06/2003	Junji Shirokoshi	Q77943	8230

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EXAMINER	
FIDLER, SHELBY LEE	

ART UNIT	PAPER NUMBER
2861	

DATE MAILED: 04/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H:A

Office Action Summary	Application No.	Applicant(s)	
	10/702,082	SHIROKOSHI, JUNJI	
	Examiner	Art Unit	
	Shelby Fidler	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 10 recites the limitation "said electric circuit" in line 4. There is insufficient antecedent basis for this limitation in the claim. For the purpose of this rejection, examiner assumes that the aforementioned "electric substrate," in line 3, is meant as "electric circuit."

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, 8, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Kishida et al. (US 5357268).

Kishida et al. teach the following:

***regarding claim 1**, an image forming apparatus comprising:

a main section (*head drive circuit 120, Fig. 8*);

a plurality of attachment units (*recording head IC's 103 with corresponding transducers 102, Fig. 8*) which are attached to the main section in a cascade arrangement (*elements 103 attached in cascade, Fig. 8*), and each of which includes a controlled element (*transducer 102, Fig. 8*);

a line group which connects the main section with the plurality of attachment units (*lines ENB, SEL 1 - m, LAT2, CLK2, SI2, etc. connect head drive circuit 120 with each IC 103, Fig. 8*), and

which establishes communications between the main section and the controlled elements (*col. 9: 3-9 show that communication takes place between circuit 124, which is part of head drive circuit 120, and transducers 102*) which are respectively disposed to the plurality of attachment units (*each transducer 102 is respectively disposed to an IC 103, Fig. 8*), wherein

the line group includes signal lines (*recording data SI2, Fig. 8*) and selective control lines (*SEL, Fig. 8*);

the signal lines connect the controlled elements in parallel with the main section (*IC's 103 are in parallel with the head drive circuit 120, and connected by recording data SI2, Fig. 8*), to thereby realize a communication between each one of the controlled elements and the main section (*col. 9: 11-16*), and

the selective control lines connect the main section respectively with the attachment units (*SEL connects head drive circuit 120 to IC's 103, Fig. 8*), to thereby select one of the attachment units to which the main section is to communicate (*col. 9: 18-21*)

***regarding claim 2**, the selective control lines are provided in accordance with a cascade connection count of the attachment units relative to the main section (*col. 8: 62 – col. 9: 3 shows that timing generation circuit 122 generates selection signals SEL1 to SELm, one for each of the m IC's*)

***regarding claim 3**, when the main section activates any one of the selective control lines (*col. 9: 18-21*), a current path is established via the signal lines between the main section and the controlled element which is disposed to the attachment unit which corresponds to thus activated selective control line (*col. 9: 21-24*)

***regarding claim 4**, each of the attachment units comprises:

an upstream-side connector (*this connector is inherent with the signal line connection between the shown middle IC 103 and the shown left-most IC 103 in Fig. 8*) which electrically connects the

line group between this attachment unit (*middle shown IC 103 in Fig. 8*) and the attachment unit which is cascaded on the upstream side, which is closer to the main section than this attachment unit in the order of connection, or the main section (*left-most shown IC 103 in Fig. 8*); and

a downstream-side connector (*this connector is inherent with the signal line connection between the shown middle IC 103 and the adjacent IC 103 to its right, not shown in Fig. 8*) which electrically connects the line group between this attachment unit (*middle shown IC 103, Fig. 8*) and the attachment unit which is cascaded on the downstream side which is opposite to the upstream side in the order of connection (*adjacent IC 103 to its right, not shown in Fig. 8*)

***regarding claim 5**, the main section comprises a main-section connector to connect the line group electrically to the attachment unit (*this connector is inherent with the signal line connection between the head drive circuit 120 and the left-most shown IC 103 in Fig. 8*), and

the main section connector and the downstream-side connector are structured so as to be connected with the upstream-side connector (*left-most IC 103 is connected to head drive circuit 120 and the adjacent IC 103 to the right, not shown in Fig. 8*)

***regarding claim 6**, a relay substrate, which is for mutually connecting straight-joint harnesses connected respectively to the upstream-side connector and the downstream-side connector, is disposed inside each one of the attachment units (*Fig. 8 shows that each IC 103 acts as a relay for the selection signals SEL not associated with that particular IC*)

***regarding claim 8**, the plurality of attachment units have the same function with each other (*col. 9: 18-24 shows that the drive IC's 103 function to drive the transducers 102*)

***regarding claim 9**, the plurality of attachment units have the same structure with each other (*Fig. 8*)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kishida et al. (US 5357268) in view of Fleming et al. (US 4100597).

Kishida et al. teach the following:

***regarding claim 7**, each one of the attachment units' internal wirings have an upstream-side connector (*this connector is inherent with the signal line connection between the shown middle IC 103 and the shown left-most IC 103 in Fig. 8*) and a downstream-side connector (*this connector is inherent with the signal line connection between the shown middle IC 103 and the adjacent IC 103 to its right, not shown in Fig. 8*)

Kishida et al. do not expressly teach the following:

***regarding claim 7**, each one of the attachment units' internal wirings are installed in such a manner that the position of a contact in the upstream-side connector assigned to the selective control line corresponding to this attachment unit is identical between the attachment units

Fleming et al. teaches the following:

***regarding claim 7**, each one of the attachment units' (*boards 80*) internal wirings are installed between the upstream-side connector and the downstream-side connector in such a manner that the position of a contact in the upstream-side connector assigned to the selective

control line corresponding to this attachment unit is identical between the attachment units (*col. 43: 48-52*)

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify Kishida et al.'s internal wirings to be identical between attachment units. The motivation for doing so, as taught by Fleming et al., is so that macrofunctions (controlled elements) may be interchanged or substituted (*col. 43: 48-52*).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kishida et al. (US 5357268) in view of Yamaguchi (US 4366489) and Reed et al. (US 4720798).

Kishida et al. teach the following:

***regarding claim 10**, each one of the attachment units comprises a circuit as a relay (*Fig. 8 shows that each IC 103 relays SEL and LAT lines*) on which an electric substrate is mounted (*Integrated Circuits 103 include latches, flip-flops, etc., Fig. 8*), and

the electric circuit includes the controlled element (*each IC 103 includes its corresponding transducers 102, Fig. 8*), is connected to the upstream-side connector (*middle shown IC 103 in Fig. 8 connects to the left-most shown IC 103*), and is connected to the downstream-side connector (*middle shown IC 103 in Fig. 8 connects to adjacent IC 103, not shown in Fig. 8*)

Kishida et al. do not expressly teach the following:

***regarding claim 10**, the circuits are printed circuit boards; and

the electric circuit is connected to the upstream-side connector and the downstream-side connector with groups of straight cables

Yamaguchi teaches the following:

*note: selection drive circuits 1, and their corresponding tracings are read as attachment units

***regarding claim 10**, the electric circuit is connected to the upstream-side connector (*inherent connector between left-most circuit 1 in Fig. 1 and 2nd to left-most circuit 1*) and the downstream-side connector (*inherent connector between 2nd to left-most circuit 1 and 3rd to left most circuit 1 in Fig. 1*) with groups of straight cables (*Fig. 1 shows that selection signals S1-S6 are straight tracings between connectors*)

Reed et al. teach the following:

***regarding claim 10**, the circuits are printed circuit boards (*col. 1: 31-39*)

At the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize straight cables in connecting the electric circuit to upstream-side and downstream-side connectors (Kishida et al.) and to utilize printed circuit boards (Reed et al.), as taught by Koshida et al. and Reed et al., for the purposes of making the tracings single and continuous lines so there will be no error in creating the straight tracings (*Kishida et al. - col. 20: 37-40*), and since printed circuit boards are easy and economical to mass manufacture (*Doggett et al. US 5148595 - col. 1: 31-40*).

Communication with the USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shelby Fidler whose telephone number is (571) 272-8455. The examiner can normally be reached on MWF 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SLF

K. FEGGINS
PRIMARY EXAMINER
4/06